EMERGENCY AIRWORTHINESS DIRECTIVE

Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
**Federal Aviation
Administration**

We post Emergency ADs on the internet at "www.faa.gov"

DATE: December 17, 2002
AD #: 2002-25-51

Send to all U.S. owners and operators of Agusta S.p.A. (Agusta) Model A109E helicopters.

This superseding Emergency Airworthiness Directive (AD) requires reducing the tail rotor (T/R) blade life limit and modifying and re-identifying the T/R hub and grip assembly. This AD also clarifies the never-exceed speed (Vne) restrictions and modifies the T/R visual inspection intervals. The reduction in the T/R blade life limit is prompted by analysis indicating that T/R blades installed on certain T/R hub and grip assemblies have a lower fatigue life than originally calculated. This AD clarifies reducing the Vne by 28 knots indicated airspeed (KIAS) in addition to any reduction imposed by optional equipment installed on the helicopter. Modifying the T/R hub and grip assembly removes the Vne restriction and new life limits imposed by this AD. The existing AD was prompted by the failure of a T/R blade that resulted in a forced autorotative landing. The failure, which occurred on June 12, 2002, was determined to be caused by fatigue. This significant reduction in the service life of the T/R blades creates an unsafe condition. This condition, if not corrected, could result in fatigue failure of the T/R blade and subsequent loss of control of the helicopter.

The FAA previously issued AD 2002-17-51 on October 17, 2002 (67 FR 67510, November 6, 2002), that superceded Emergency AD 2002-14-51, issued on July 9, 2002. AD 2002-17-51 imposes a Vne of 140 KIAS. The AD also requires visually checking the T/R blades on both sides for a crack before each start of the helicopter engines; visually inspecting the T/R blades with a 5x or higher magnifying glass at 25 hour time-in-service (TIS) intervals and anytime an increase in vibration occurs, and conducting a dye-penetrant inspection if necessary; and replacing any cracked T/R blade with an airworthy T/R blade. Since the issuance of that AD, analysis and tests have shown that the fatigue failure of the T/R blades was caused by unanticipated loads on the T/R blades. The manufacturer has redesigned the T/R grip bushings to reduce these loads.

The FAA has reviewed Agusta Alert Bollettino Tecnico 109EP-30, Revision B, dated November 27, 2002 (ABT), which maintains the visual check for cracks, the 5-hour TIS inspections with a magnifying glass, establishes a new life limit for the T/R blades, clarifies the Vne restrictions, modifies the T/R inspection intervals, and describes procedures for modifying and re-identifying the T/R hub and grip assembly by replacing T/R grip bushings (bushings), part number (P/N) 109-8131-29-101. Modifying and re-identifying the T/R hub and grip assembly restores the T/R blade life limits, and cancels the Vne limitations.

The Ente Nazionale per l'Aviazione Civile (ENAC), the airworthiness authority for Italy, notified the FAA that an unsafe condition may exist on this helicopter model. The ENAC advises inspecting for cracks in T/R blades and replacing the T/R blades and bushings as called for in the ABT. The ENAC classified the ABT as mandatory and issued AD No. 2002-592, dated November 28, 2002, to ensure the continued airworthiness of these helicopters.

This helicopter model is manufactured in Italy and is type certificated for operation in the United States under the provisions of 14 CFR 21.29 and the applicable bilateral agreement. Pursuant to the applicable bilateral agreement, the ENAC has kept the FAA informed of the situation described above. The FAA has examined the findings of the ENAC, reviewed all available information, and determined that AD action is necessary for products of this type design that are certificated for operation in the United States.

The visual check required by this AD may be performed by an owner/operator (pilot), but must be entered into the aircraft records showing compliance with paragraphs (b) and (h) of this AD in accordance with 14 CFR 43.11 and 91.417(a)(2)(v). This AD allows a pilot to perform this check because it involves only a visual check of the T/R blade for a crack and may be performed equally well by a pilot or mechanic.

The unsafe condition described in this AD is likely to exist or develop on other helicopters of the same type design. Therefore, this AD requires:

Applicability A: Agusta Model A109E helicopters with T/R hub and blade assembly, P/N 109-8131-02-151.

- Before further flight, placarding the helicopter and marking the airspeed indicator to reduce the helicopter Vne by 28 KIAS in addition to any reduction in Vne caused by optional equipment installation.
- Before each start of aircraft engines, visually checking each T/R blade for a crack.
- Within 5 hours TIS, and thereafter at intervals not to exceed 5 hours TIS, visually inspecting the T/R blade for a crack using a 5X or higher magnifying glass. If in doubt as to the existence of a crack, dye-penetrant inspect the T/R blades for a crack.
- Before further flight, replacing any unairworthy T/R blade with an airworthy T/R blade.
- Establishing a new life limit on the T/R blade, P/N 109-8132-01-111, of 200 hours TIS.
- Within 10 hours TIS, for helicopters having T/R blades with 190 hours TIS or more, replacing the blades.
- On or before May 31, 2003, modifying the T/R hub and grip assembly. Modifying and reidentifying the T/R hub assembly removes the Vne restrictions imposed, restores the T/R blades life limit to 1,000 hours TIS, and changes the AD requirements for the helicopter from Applicability A to Applicability B.

Applicability B: Agusta Model A109E helicopters, with T/R hub and blade assembly, P/N 109-8131-02-157.

- Before each start of the helicopter engines, visually checking the T/R blade for a crack.
- Within 25 hours TIS, and thereafter at intervals not to exceed 25 hours TIS, visually inspecting the T/R blade for a crack using a 5X or higher magnifying glass. If in doubt as to the existence of a crack, dye-penetrant inspect the T/R blades for a crack.
- Before further flight, replace any unairworthy T/R blade with an airworthy T/R blade.
- Before accumulating 150 hours TIS on the T/R hub assembly, P/N 109-8131-02-159, and thereafter at intervals not to exceed 150 hours TIS, inspect the bushings, P/N 109-8131-30-109. Replace any unairworthy bushing with an airworthy bushing.

This rule is issued under 49 U.S.C. Section 44701 pursuant to the authority delegated to me by the Administrator, and is effective immediately upon receipt of this emergency AD.

2002-25-51 AGUSTA S.p.A (Agusta): Docket No. 2002-SW-55-AD. Supersedes AD 2002-17-51, Amendment 39-12936, Docket No. 2002-SW-42-AD.

Applicability A: Model A109E helicopters with tail rotor (T/R) hub and blade assembly, part number (P/N) 109-8131-02-151 (the T/R hub and blade assembly consists of two T/R blades, P/N 109-8132-01-111, and T/R hub and grip assembly, P/N 109-8131-02-127), certificated in any category.

Applicability B: Model A109E helicopters with T/R hub and blade assembly, P/N 109-8131-02-157 (the T/R hub and blade assembly consists of two T/R blades, P/N 109-8132-01-111, and T/R hub and grip assembly, P/N 109-8131-02-159), certificated in any category.

Note 1: This AD applies to each helicopter identified in the preceding applicability provision, regardless of whether it has been otherwise modified, altered, or repaired in the area subject to the requirements of this AD. For helicopters that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (n) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

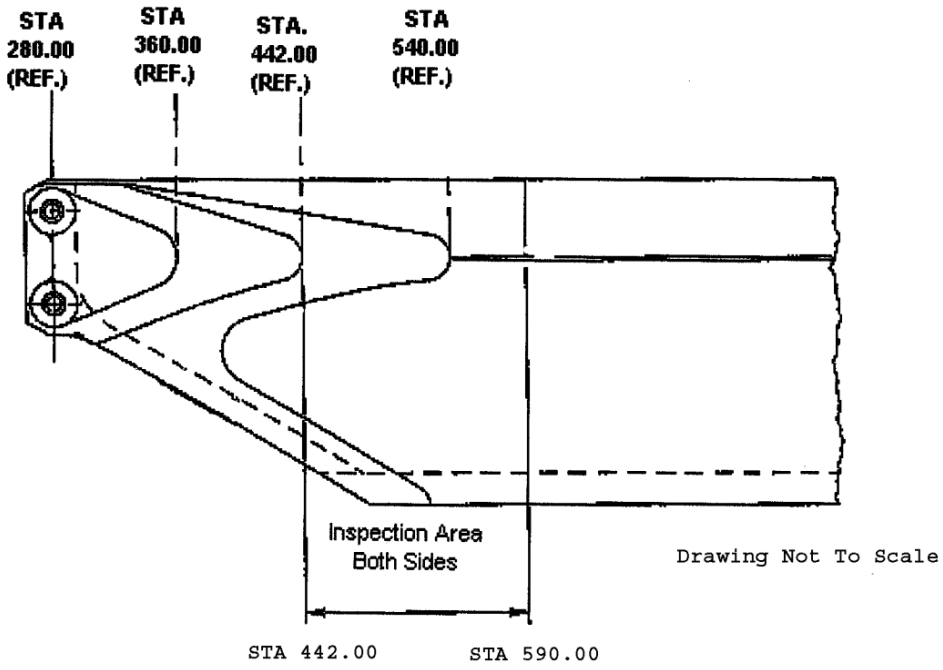
Compliance: Required as indicated, unless accomplished previously.

To prevent fatigue failure of the T/R blade and subsequent loss of control of the helicopter, accomplish the following:

Applicability A

(a) Before further flight, placard the helicopter and mark the airspeed indicator to reduce the helicopter never-exceed speed (Vne) by 28 KIAS in addition to any reduction in Vne caused by optional equipment installation, in accordance with the Compliance Instructions, Part I, paragraph 1 of Agusta Alert Bollettino Tecnico 109EP-30, Revision B, dated November 27, 2002 (ABT).

(b) Before each start of the helicopter engines, visually check both sides of each tail rotor blade for a crack in the area depicted in Figure 1 of this AD. An owner/operator (pilot) holding at least a private pilot certificate may perform this visual check and must enter compliance with this paragraph into the aircraft maintenance records in accordance with 14 CFR 43.11 and 91.417(a)(2)(v). See Figure 1:



Part Number 109-8132-01-111 Tail Rotor Blade

FIGURE 1

(c) Within 5 hours time-in-service (TIS), and thereafter at intervals not to exceed 5 hours TIS, and before further flight anytime there is an increase in vibration levels:

(1) Using a 5x or higher magnifying glass, visually inspect each T/R blade for a crack in accordance with the Compliance Instructions, Part III, paragraphs 1. through 5., of the ABT. Reporting to Agusta Service Engineering is not required.

(2) If you are unable to determine by the visual inspection whether there is a crack, dye-penetrant inspect the T/R blade for a crack in accordance with the Compliance Instructions, Part III, paragraph 6., of the ABT.

(d) Before further flight, replace any unairworthy T/R blade with an airworthy blade.

(e) This AD establishes a new life limit on the T/R blade, P/N 109-8132-01-111, of 200 hours TIS.

(f) Within 10 hours TIS, for helicopters having T/R blades with 190 hours TIS or more, replace the T/R blades with airworthy blades.

(g) On or before May 31, 2003, modify the T/R hub and grip assembly in accordance with the Compliance Instructions, Part V, of the ABT. Neither returning the removed blades nor the grips and bushings to the manufacturer is required. Modifying the T/R hub and grip assembly removes the Vne restrictions imposed, restores the T/R blades' life limit to 1,000 hours TIS, and changes the AD requirements for the helicopter from Applicability A to Applicability B.

Applicability B

(h) Before each start of the helicopter engines, visually check both sides of each tail rotor blade for a crack in the area depicted in Figure 1 of this AD. An owner/operator (pilot) holding at least a private pilot certificate may perform this visual check and must enter compliance with this paragraph into the aircraft maintenance records in accordance with 14 CFR 43.11 and 91.417(a)(2)(v). See Figure 1.

(i) Within 25 hours TIS, and thereafter at intervals not to exceed 25 hours TIS, and before further flight anytime there is an increase in vibration levels:

(1) Using a 5x or higher magnifying glass, visually inspect each T/R blade for a crack in accordance with the Compliance Instructions, Part III, paragraphs 1. through 5. of the ABT. Reporting to Agusta Service Engineering is not required.

(2) If you are unable to determine by the visual inspection whether there is a crack, dye-penetrant inspect the T/R blade for a crack in accordance with the Compliance Instructions, Part III, paragraph 6. of the ABT.

(j) Before further flight, replace any unairworthy T/R blade with an airworthy blade.

(k) On or before accumulating 150 hours TIS on the T/R hub and grip assembly, P/N 109-8131-02-159, and thereafter at intervals not to exceed 150 hours TIS, inspect the bushings', P/N 109-8131-30-109, linings for wear in accordance Part VI of the ABT. Replace any unairworthy bushing with an airworthy bushing.

(l) This AD revises the helicopter Airworthiness Limitations section of the maintenance manual by establishing a new retirement life for the T/R blade of 200 hours TIS, and after modifying the T/R hub and grip assembly, restores the retirement life to 1,000 hours TIS.

(m) T/R blades, P/N 109-8132-01-111, which have been operated as part of the T/R hub and blade assembly, P/N 109-8131-02-151, are considered unairworthy components of the T/R hub and blade assembly, P/N 109-8131-02-157, regardless of TIS.

(n) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Regulations Group, FAA. Operators shall submit their requests through an FAA Principal Maintenance Inspector, who may concur or comment and then send it to the Manager, Regulations Group.

(o) Special flight permits will not be issued.

(p) Copies of the applicable service information may be obtained from Agusta, 21017 Cascina Costa di Samarate (VA) Italy, Via Giovanni Agusta 520, telephone 39 (0331) 229111, fax 39 (0331) 229605-222595.

(q) **Emergency AD 2002-25-51, issued December 17, 2002, becomes effective upon receipt.**

Note 2**:** The subject of this AD is addressed in Ente Nazionale per l'Aviazione Civile, Italy, AD No. 2002-592, dated November 28, 2002.

FOR FURTHER INFORMATION CONTACT: Jim Grigg, Aviation Safety Engineer, FAA, Rotorcraft Directorate, Rotorcraft Standards Staff, Fort Worth, Texas 76193-0110, telephone (817) 222-5490, fax (817) 222-5961.

Issued in Fort Worth, Texas, on December 17, 2002.

David A. Downey,
Manager, Rotorcraft Directorate,
Aircraft Certification Service.